F·A·A·M facility for airborne atmospheric measurements

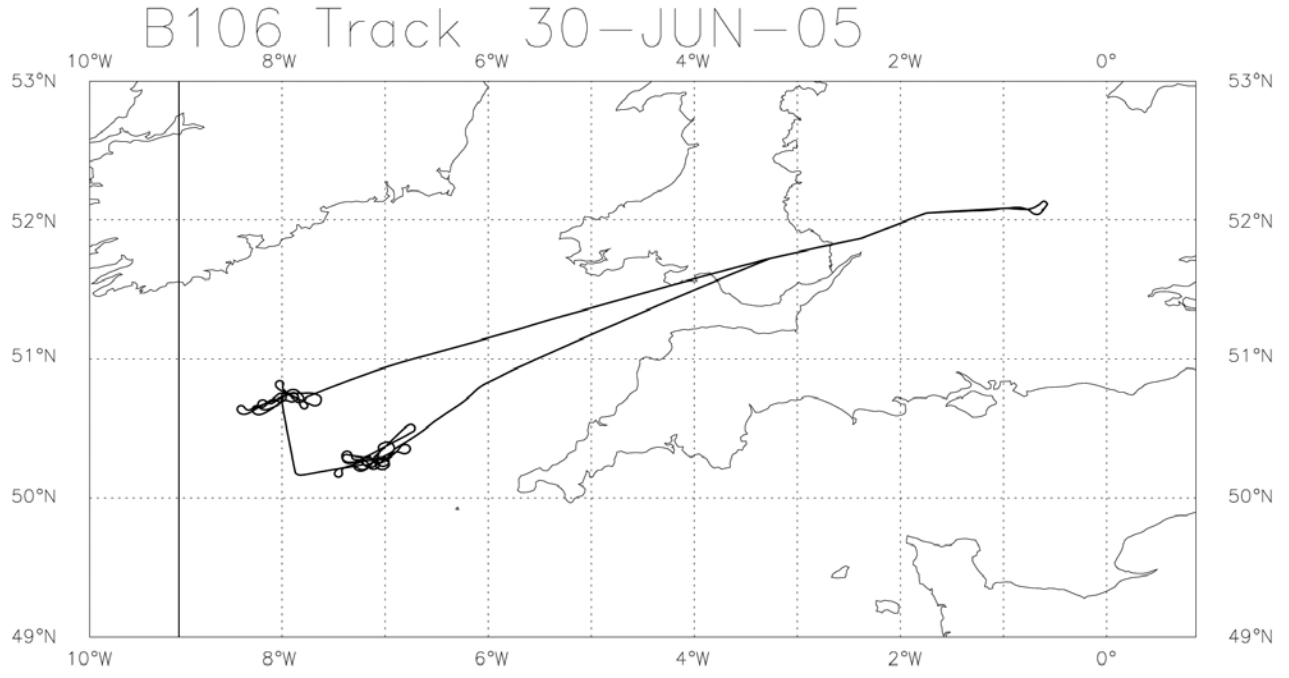
FLIGHT FOLDER

Flight No.:	B106
Date:	30 Jun 2005
Take Off	10:51:25
Landing:	15:22:54
Flight Time	4h31m29

Campaign: ICEPIC
Trials Instructions:
Operating Area: SW approaches

POB	Position	Name	Institute
1	Captain	Alan Roberts	Directflight
2	Co-pilot	Ian Ramsey-Rae	Directflight
3	CCM	Sue Angold	Directflight
4	Mission Scientist 1	Jonathan Smith	Leeds
5	Flight Manager	Stephen Devereau	FAAM
6	Cloud Physics/CCM2	Jamie Trembath	FAAM
7	CVI/CCN	Stuart Heath	FAAM
8	ADA / CPI	Martin Gallagher	Manchester University
9	Mission Scientist 2	Richard Cotton	Met Office
10	AMS / CCN training	Hugh Coe	Manchester University
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

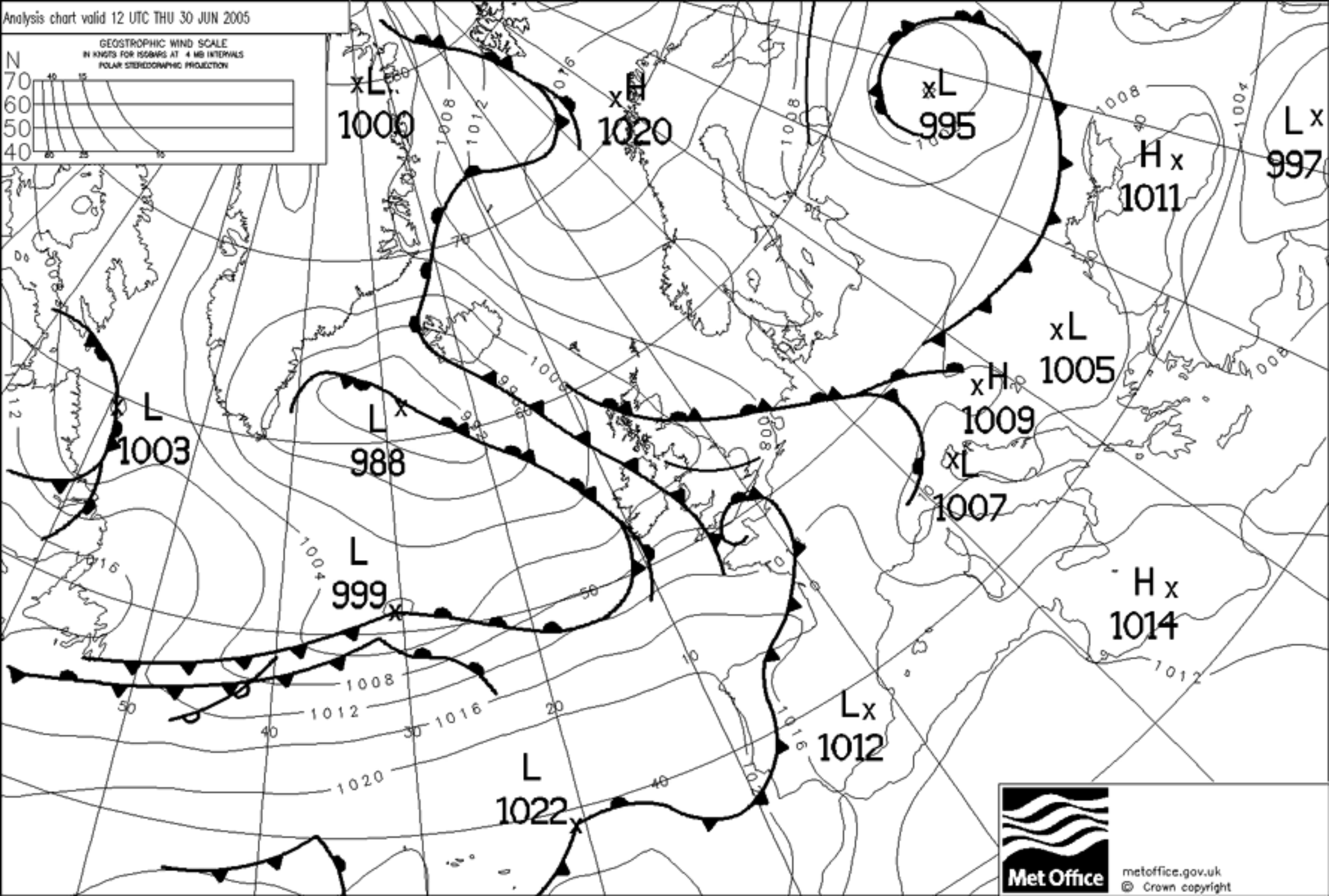
Flight Track:



FLIGHT SUMMARY

Flight No B106
Date: 30th June 2005
Project: ICEPIC
Location: SW Approaches

Start Time	End Time	Event	Height (s)	Hdg	Comments
103115		INU to Nav			
105125		T/O	5.0 kft	268	
110431		J/W zeroed	9.8 kft	245	
112725		Fwd camera iced	18.0 kft	250	
113259		Fwd camera clear	18.0 kft	248	
114215	120504	Profile 1	18.0 - 5.4 kft	248	
115544		interrupt P1	5.4 kft	247	
120400	120932	Run 1.1	5.3 kft	247	
121255	121452	Run 1.2	7.3 kft	054	
121823	121952	Run 1.3	7.9 kft	230	
122305	122446	Run 1.4	8.2 - 8.1 kft	052	
122738	122946	Run 1.5	8.3 kft	253	
123321	123519	Run 1.6	8.4 kft	060	
123832	124013	Run 1.7	8.8 kft	316	
124314	124522	Run 1.8	8.8 kft	124	
130409	130524	Run 2.1	8.9 kft	077	
130850	131018	Run 2.2	8.9 - 9.0 kft	249	
131320	131501	Run 2.3	9.2 kft	078	
131757	131939	Run 2.4	9.5 kft	273	
132305	132434	Run 2.5	9.7 kft	084	
132738	132912	Run 2.6	9.9 kft	253	
133250	133439	Run 2.7	10.0 kft	035	
133742	133903	Run 2.8	10.0 kft	240	
134241	134419	Run 2.9	10.2 - 10.3 kft	048	
134800	134858	Run 2.10	9.8 kft	226	
135520	141831	Profile 2	11.0 - 0.50 kft	278	
135734		interrupt P2	9.0 kft	279	
135933		recommence P2	9.0 kft	063	
140519		interrupt P2	4.4 kft	052	
140845		recommence P2	4.3 kft	225	
141306		interrupt P2	2.1 kft	226	
141501		recommence P2	2.2 kft	039	
141842	142629	Run 3	0.58 - 0.61 kft	050	
142820	143622	Run 4	1.6 kft	057	
152254		Land	0.55 kft	356	


Analysis chart valid 12 UTC THU 30 JUN 2005
GEOSTROPHIC WIND SCALE
IN KNOTS FOR ISOBARS AT 4 MB INTERVALS
POLAR STEREOGRAPHIC PROJECTION
N
70
60
50
40
L
1000
H
1020
L
995
H
1011
L
997
L
1003
L
988
L
1005
H
1009
L
1007
L
999
H
1014
L
1022
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1012
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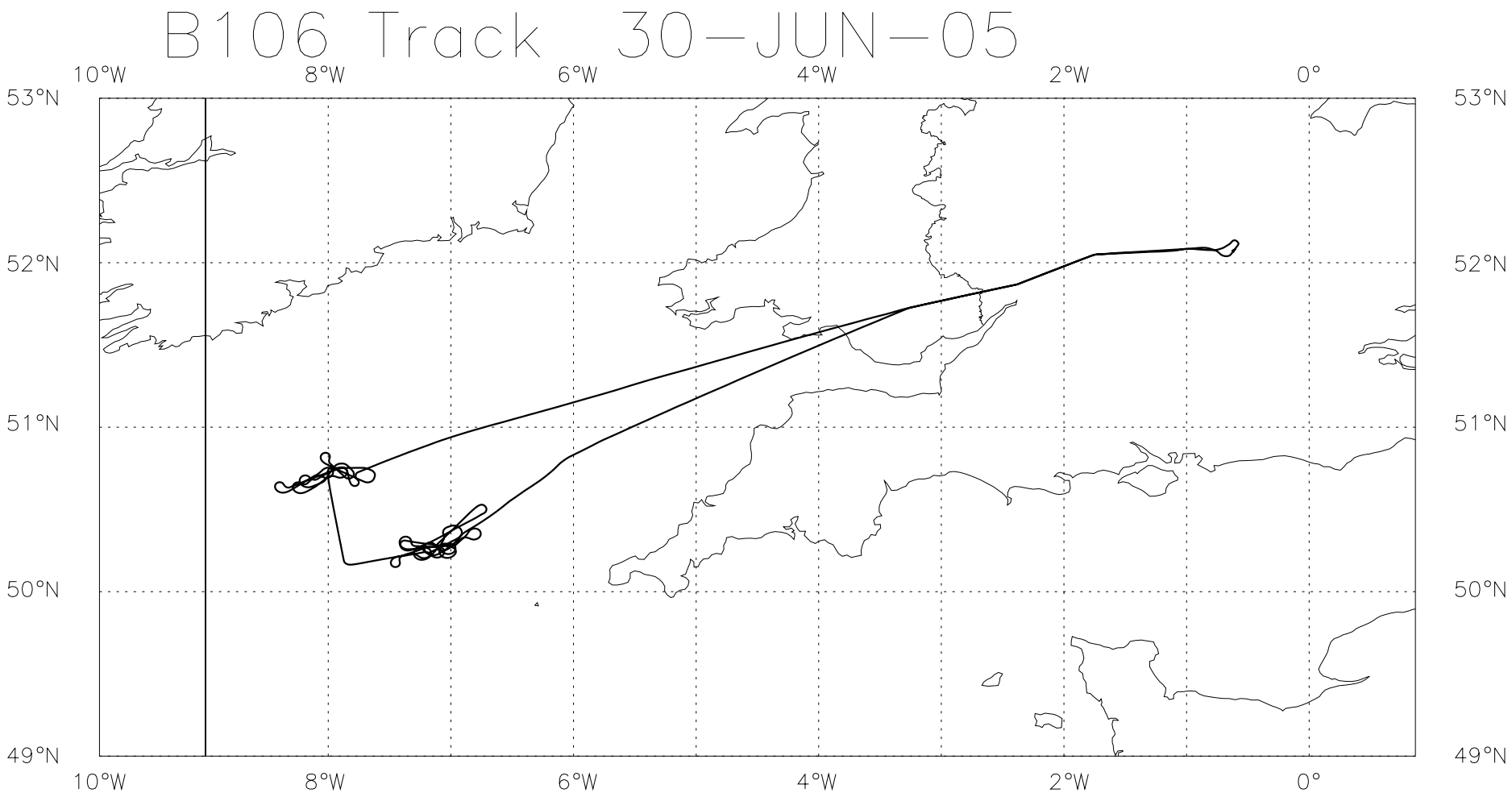
B106 Track 30-JUN-05
10°W
8°W
6°W
4°W
2°W
0°
53°N
52°N
51°N
50°N
49°N

PROJECT BRIEF: ICEPIC – development of ice and precipitation in cumulus clouds.

Scientific Aims: The goal of ICEPIC is to understand and quantify the formation and growth of ice particles in cumulus clouds. We wish to examine:

- the formation of the first ice due to primary nucleation on ice nuclei (IN)
- the development of ice via secondary processes such as the Hallett-Mossop process, in which new ice particles are generated during the riming growth of ice particles
- other secondary ice production processes, such as evaporative break-up;
- the production of supercooled raindrops and their role in the glaciation process
- the dependence of these processes on the dynamics of the cloud
- the production of precipitation

As a first priority, in-situ aerosol and microphysical measurements from the aircraft will be gathered in close coordination with the CAMRa radar at Chilbolton, Hants. Measurements will be made in cumulus clouds when their tops are about 0°C through to when the tops have grown to about -20°C. The radar may identify columns of supercooled raindrops within the growing cumulus clouds that can be investigated more intensively by the aircraft.

Weather conditions: Developing showers that are forecast to have tops up to about -15°C within range of the Chilbolton radar. It may be preferable to fly to an alternative region away from the radar if conditions are more suitable.

Safety: Regions that paint RED on the aircraft weather radar should be avoided. No flight into clouds known to be producing lightning. Information on current location of lightning (sferics) can be provided by FAAM using the NAMIS system. Several aircraft will be operating in the boundary layer at the same time as part of CSIP: UFAM Cessna - entire project; German DO-128 - 20 June to 17 July; NERC DO-228 - August. (The BAS Twin Otter may also participate in CSIP.)

Key instruments and their operation

Basic meteorology

- Rosemount temperatures, GE hygrometer
- FWVS
- GPS (including cruciform), INU, turbulence probe When in supercooled liquid water, Flight Manager or PIs should monitor turbulence probe calibrated differential pressures for signs of icing (cessation of variability on signal).

Cloud Physics/Aerosol

- FFSSP, 2DC, 2DP (or CIP-100), PCASP, SID-1 (and *SID-2*). Normal monitoring to ensure correct operation. Operator should note particular features of interest eg. high concentrations, pristine ice crystal habits, large drops (d > 100 μm) in 2D imagery above freezing level.
- *(ADA)*/CPI as above
- CCN measurements should be made by filling the alleviator (2min reqd.) whilst in clear air either below, between or upwind of the cloud layer(s) of interest.
- *Ice Nucleus counter (INC) will normally be operated in clear air and under fixed conditions of temperature and supersaturation so as to maintain it in a stable condition. Allow additional time between runs for the operator to adjust it to different conditions.*
- J-W LWC and Nevzorov LWC/TWC. When straight/level and in clear air, these should be zeroed/calibrated and a note made in the Flight Managers log.
- TWC - profile ascents/descents should avoid cloud if possible
- AMS - min 2mins (~12km) reqd for size-resolved composition distribution.
- CVI - below cloud base, normal operation is in aerosol mode

- above cloud base, normal operation is in CVI mode to sample cloud particle residues into the AMS.

SORTIE BRIEF: **ICEPIC** ICE and Precipitation Initiation in Cumulus clouds
Flight Number: **B106**
Date: **30th June 2005**
Mission Scientist: Jonathan Smith

Sortie Aims: To measure development of microphysics and dynamics in cumulus cloud systems.
Location: Amongst developing cumulus clouds within 1·5 hours transit of Cranfield. Areas Alpha and Echo, with preference be to west of Chilbolton radar facility (to be within radar range).
Sortie Summary:

1. Characterise inflow atmosphere around and below developing cumulus – *where not done by CSIP*
2. Penetrate cumulus clouds, preferably near the top of growing turrets, through the updraught. All cloud penetrations should be *with wings level*. Three principal options are for:
   - **A** well-defined isolated clouds
   - **B** many clouds (RICO scenario)
   - **C** organised convection on a convergence line or a gust front.

Meteorological information will be given from the CSIP Operations Centre at Chilbolton before flight and in-flight (using VHF radio, new frequency is 130.575 MHz, call-sign remains "Radsearch").

Sortie Detail

1. Out-of-Cloud: only where not done by CSIP

1.1. Take off and climb for transit to the operating area. Locate suitable growing cumulus. 40+ min

1.2. Optional profile descent in clear air, 1000 ft/min, FL200 to 500 ft agl. If necessary step profile to stay in area. (Not required at Chilbolton) Set altitudes and directions for later†. *25 min*

1.3. Run at 500 ft agl, minimum length 50 km along suitable azimuth (across line or front for Option **C**) to sample inflow aerosols & IN. May require initial delay to settle instruments. 10 min

1.4. Ascend to 500 ft below cloud base and carry out 50 km run on suitable azimuth to sample inflow aerosols & IN. May require delay after ascent to settle instruments. 15 min

2. Cloud Work Options

Option A: Isolated *developing* clouds – ascend with clouds, near their top

A.1. Proceed to about 0° C altitude†, or below max cloud top if lower 5 min

A.2. Adjust altitude to 500 ft below cloud top and penetrate cloud. The penetration should be made at a constant azimuth and altitude. It is important to penetrate the growing turret, updraught, region. Once clear of cloud, continue run for 10 s then procedure turn to return to same region of cloud as quickly as possible. 5 min

A.3. As time permits, repeat A.2, ascending with the top (if appropriate) until T = -20° C†.
{ Vertical separation of repeats set to match growth of cloud} 45 min

Option B: Many *developing* cumulus clouds – sample many clouds

B.1. Proceed to 0° C altitude†, or max cloud top if lower 5 min

B.2. Commence 10 min run in along shear direction†. Adjust track to randomly sample growing turret / updraught regions of cloud but without passing through RED radar echoes (reflectivities of 37 dBZ or greater). End run clear of cloud. 10 min

B.3. As time permits, repeat an ascent by -3° C† (*approximately* 1500 ft) followed by a run as in B.2 until the lowest of -15° C† or max cloud top is reached. (-3, -6, -9, -12, -15° C†) 75 min

Option C: Clouds with linear organization (eg. along a convergence line or gust front).

C.1. Proceed to 0° C†, or max cloud top if lower 5 min

C.2. Fly leg perpendicular to line, length as required. Adjust track to penetrate cloud tops or cell centres. End run clear of cloud. 2 min

C.3. As time permits, repeat a 180º turn and ascent followed by C.2. Ascent either; as **A** to 500 ft below cloud tops until -20° C† reached, or as **B** at fixed temperature levels. 30+ min

3. Repeat If time permits, for new developing cumulus carry out Option **A**, **B** or **C.**

Transit return at any suitable altitude. 40+ min

Mission Scientist's De-brief

Flight no. :- B106 **Date :- 30th June 2005**

***Draft* Summary for ICEPIC flight**

- Two growing cumulus clouds were measured as they passed through 0°C, but neither ascended beyond –4°C.
- No ice particles were seen, just water droplets – some large.
- Turrets appeared to be in two parts, or have a hole in the middle.
- No ice cloud above for either cloud, though a layer of As adjoined the first cloud.
- A good "Option A" track pattern for the runs on the second cloud.

1. Assessment of the flight

A good set of runs through the second cumulus cloud, with three turrets growing above the freezing level (and above a layer of stratocumulus spreading out around the turrets). The cloud was isolated, no other clouds adjacent or above. Initial measurements were on the strongest, middle, turret at 8,900 ft at 50·2° N, 7·5 W. It took between 24 and 30 seconds to transit the turret. This turret was followed as it grew up to 9,200 ft when attention then swapped to the northerly turret. This showed a small patch of red echo on the weather radar. There may have been two parts to this second turret, transit time was about 18 seconds. Drops up to 3 mm in size were seen by the 2D. It grew as the other turrets decayed, eventually reaching 10,200 ft before decaying back as had the other two turrets. Profile 2 immediately after showed a small inversion at this level, and a mainly dry atmosphere (most moisture near the surface). The cloud may have stopped growing as buoyancy was lost as the drier external air was entrained in, or maybe the spreading Sc around the turrets shaded the sea surface from the sun and cut off surface heating.

Figure 1 Second turret of second cloud, Run2.6

Measurement of boundary layer properties was recommenced immediately after the second cloud stopped growing. Profile 2 started 1,000 ft above the cloud maximum and was interrupted to come back under cloud 2. The 500 ft agl and 500 ft below cloud base runs were then taken while leaving the area. Only at the very end of the last run (R4) did the character of the atmosphere change – fewer and smaller boundary layer Cu and higher Ci encroaching from the east.

The first Cu was measured soon after identifying the area as one with no Ci above and Cu growing beyond the boundary layer. Profile 1 into the area was interrupted so as not to miss the growth of the cloud through the 0°C level. This, along with no overlying Ci, would ensure that any ice seen was due to the processes in this cloud. The first run was at

Figure 2 Pileus above first cloud, Run 1.6

5,300 ft (+3°C) at 50·6 N, 8·3 W. It showed a more complicated structure on the far side of the Cu – a layer of As was adjacent and probably associated with the Cu. It took between 20 to 30 seconds to transit through the turret. Large drops were seen by the 2D on Run 1.3. Pileus cloud started to form above the cloud. A few minutes later, growth slowed.

2. Summary of the weather conditions

Complex situation with several fronts analysed lying NW to SE over British Isles. Depression on one of these fronts was situated over Brittany at 06Z and then tracked NE up the Channel. In behind the occlusion on this system, and ahead of the next occluding warm front, a clearance developed over the SE Irish coast (0930Z satellite image). The clearance was associated with slight ridging between the fronts. . This clearance spread with the prevailing wind to cover the sea to the south of Ireland. A layer of high cloud, lying N-S, persisted over Lands End. In the clearance (where the measurements were taken) there was little or no upper cloud but abundant boundary layer Cu. Some Cu built up to an inversion at the freezing level, some progressing further. At 12Z, when the aircraft entered the area, some larger Cu had already proceeded beyond the inversion over the Irish coast. Over the sea, other Cu had reached the inversion and spread out as Sc.

Jonathan A. Smith, University of Leeds 3rd July 2005

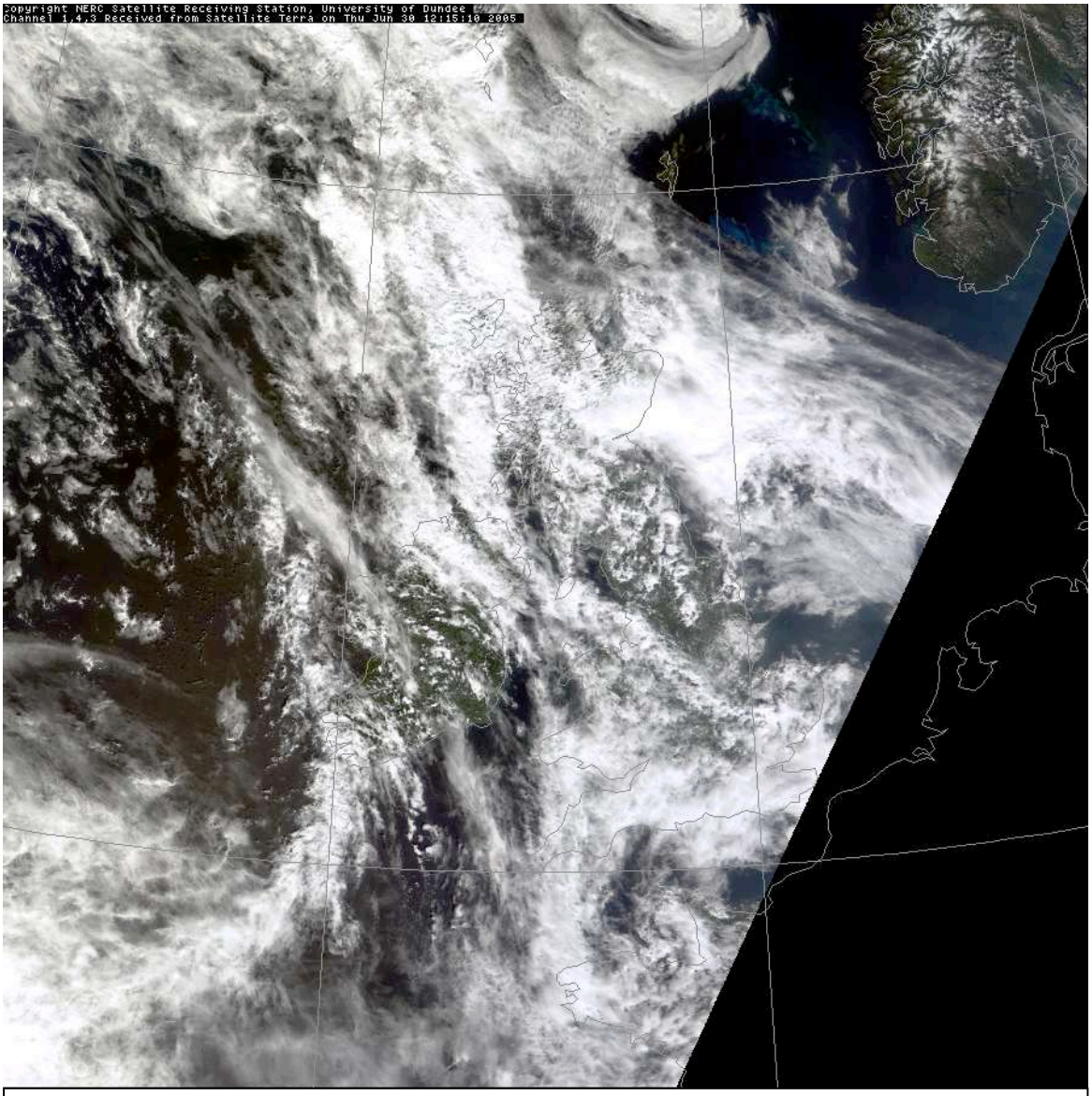

Figure 3 MODIS image from Dundee, "channel 38" simulated RGB, 1215Z

Mission Scientist's Log

Jonathan Smith

Flight No **B**.106..... Date 30th June '05 Page 1 of 3

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
10~~:49~~	t/o				8/8 Cu
10:50	climb out	16000ft			Cbase, visibility good
10:52	transit	5000ft			7/8 Cu 1/8 Ci - outside T = 11°C slight inst.
11:02	climb in cloud	5300	264	52.0 / 1.6W	Cu - main top level, a few higher
0°C at 725 hPa or	approx. 9000	ft	→ this side (East) of system		
11:25:06	transit	FL180	250	51.5N/42W	now in cloud, before had 0/8 (2 oct) Ci cloud
11:31	"	"			1/8 Cs, 7/8 Sc, 1/8 As
11:42:15	P1 start		248		
11:44	↓	16,000			-15
					-12 ~ 580 hPa
		13,500			-10
					-9 ~ 620 hPa
		11,800			-6
11:52		8,700			-3 2/8 As 2/8 Cu 2/8 Sc
		6700			0 ~~670~~ hPa 775 say 6,500 as target
	↓				
1157	hold or Profile	5300 ft	246		+5°C
11:59		good cloud ahead			- into Irish airspace
ship to port A					1
12:07					into cloud, bit bumpy at a bit low
some As on other side rn					As ahead + down behind 13:15 20s
12:18	drop 200	ft	seemed	best time drop	30

" 17:59 - mb

12:19:30 → hole in middle 18:35

Mission Scientist's Log

Flight No **B**...106... Date ...30th June '05... Page ...2... of ...3...

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GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
					2D - large drops on run
13:20					SID 50% is non-spherical
	RI-4				F0·8°C
					in ":48" → ":15" out ~ 30s
As layer	still	around	the	eu	
near top					~ 5s T-1·5°C
		8100			T-1·6h next
	V.				As above start of run
looks like	two	tracks	in		
fine through it is					
12:42:21		Last run →	nearer	top than	time before
		∴ will	now	repeat	at same altitude
12:43:14		8800			cloud to rear has built up
large	area	has	stopped		"08" into cloud out
13:02 →	new	cloud		popped	thro' inversion layer
	(one	to South			
13:04	'39'	into	'02'	out	24s
13:09	bit	high &	drop	down	(some cloud before start)
	T=	-2·		29	s" into cloud 58" out 30s
13:13	same	target	now		
13:14:50 →	25s	through	the	cloud	
different		target -	slightly	bigger	than photos
13:19:14	into	target	18s	through	it picture
		of	new	target	on nose of old one on

port now 2D 3mm drops seen

ETA Cranfield 16:20 local

Mission Scientist's Log

Flight No **B**...106..... Date 30th June '05 Page 3 of 3

FAAM © 2004

GMT	Run / Profile	Height	Hdg	GPS Position	Remarks (clouds, weather, visibility, winds, sea state etc.)
13:28					up still (Roop going) hvy
				17s	through cloud
13:33		19,000			too high —
	tops die down & nothing re-appears - time B				
	come down on altitude				
	did it stop for small				inversion or did sporadically
14:03 or so	picture of similar				clouds, but not the same
as	we worked, they are behind us.				
	edge of banking layer Cu - picture taken earlier 14:20				
	of what happened - small Cu grows either meets				
	or spreads out as Sc				
14:22:13					sea state at best 1/10 white water
14:25:29		small boat	B		
14:30:19		small boats	again		2/8 Cu above, runing below base
					hazy, 1/8 As, 3/8 Ci above
14:33					more Ci 3/8 now at the end of
14:35	R4	1500	59	51:0N/5:4W	the run
					definate change at end of run
15:02:06	transit return				picture of screen for timecheck
					(in cloud

FLIGHT NUMBER: B106	DATE: 30 Jun 2005	OPERATOR: Pre flight: Doug Anderson Post flight: Doug Anderson	Page 1 of 1
PROJECT: ICEPIC			

CORE CHEMISTRY PRE FLIGHT LOG

PRE POWER UP	
All sample lines are connected to the rack	Y
All cylinders pressures are OK	Y
Ozone Span = 504, Offset = 50	Y

GAS PRESSURES	N_2 (bar)	CO_2 / Argon (bar)	CO standard (bar)
PRE FLIGHT	65	108	110
POST FLIGHT	57	104	110

POST POWER UP - GROUND				
Ozone Sample Flow 1 (LPM)	**Ozone Sample Flow 2 (LPM)**	**NO_x Sample Flow (LPM)**	**NO_x Ozonator Flow (LPM)**	**SO_2 Sample Flow (LPM)**
0.3	0.35	1.109	0.069	0.000 initially 0.466 after reboot
CO Time check against HORACE	**CO Lamp Flow (ml/min)**	**Pressure Monochromator (bar)**	**Pressure Cell (Torr)**	
Synced @ 09:01:37	33.79	1.18	7.11	

ZEROS							Average
Ozone (ppbV)	-1 (sample A)	-1 (sample B)	-1 (sample B)	0 (sample B)	0 (sample A)	-1 (sample A)	
NO (ppbV)	0.5	0.52	0.55	0.62	0.61	0.59	0.565
NO_2 (ppbV)	0.35	0.38	0.29	0.20	0.20	0.32	0.29
NO_X (ppbV)	0.85	0.9	0.84	0.82	0.81	0.91	0.855
SO_2 (ppbV)	-3.90	-4.28	-3.44	-3.24	-3.13	-3.22	-3.535

PRE FLIGHT COMMENTS

O_3 clicking sound from instrument as sample changes from B to A. Not noticed this before. Dull, soft thud as switched from A to B..

SO_2 flow was zero initially. Rebooted @ 08:05 after which it was OK (0.466)

SO_2 Lamp Intensity was low (varying between 12500Hz & 16000Hz. Min is set to 16000Hz.
SO_2 Lamp voltage was high (1362V @ 09:58). Intensity had increased by this point though still occasionally dipping low.

CORE CHEMISTRY CALIBRATION AND FLOW LOG

PREVIOUS CO CAL	Date and Flight Level	Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)
	29 Jun 2005 14:32:23 Ground (refuel stop @ Newcastle)	78.30	94.84	7425.53

Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
08:03:01 (1st auto cal)	Ground (pre flight) (405-415)	64.79	89.19	5778.44	34.10	7.16
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample
		34.04	0.3	0.35	1.109	0.069	-

Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)	CO Lamp Gas (ml/min
08:35:53	Ground (648-652)	78.76	92.86	7313.13	50	7.15	33.95

Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)	CO Lamp Gas (ml/min
09:08:45	ground ()	77.31	95.41	7375.66	50	7.12	33.89

Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)	CO Lamp Gas (ml/min
09:41:37	ground (499-506)	75.14	96.93	7283.51			

Time	Flight Level	CO				
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)
Unmanned auto cals in flight.						
		Flows (LPM unless stated)				
		CO Lamp Gas (ml/min)	Ozone Sample 1	Ozone Sample 2	NO_x Sample	NO_x Ozonator	SO2 Sample

Time	Flight Level	CO					
		Sensitivity (Hz/ppbV)	Bkgrd (ppbV)	Bkgd Cnt R (Hz)	Lamp Temp (°C)	Cell Press (Torr)	CO Lamp Gas (ml/min
15:01:51	?? transit ()	81.14	91.02	7385.70			

CORE CHEMISTRY FLIGHT LOG

GENERAL COMMENTS

Nil

CLOUD PHYSICS LOG

Flight No. B106 **Date: 30/06/05** **Operator: JT** **Page 1 of 1**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
11:42:15	29	0.08	1	30	33	525	8	6025	800	8	Start P1 Descent @ FL180
11:43:28	30	0.09	1	3	0.5	200	8	91	200	8	170
11:44:31	39	0.12	1	30	2	100	10	8	200	10	160
11:45:37	50	0.08	1	0	0	0	0	0	0	0	150
11:46:49	45	0.08	1	0	0	0	0	0	0	0	140
11:47:51	50	0.08	1	0	0	0	0	0	0	0	130
11:48:58	80	0.09	1	0	0	0	0	0	0	0	120
11:49:58	110	0.1	1	0	0	0	0	00	0	0	110
11:51:01	322	0.12	1	0	0	0	0	0	0	0	100
11:52:07	114	0.09	1	10	1	750	8	425	800	8	90
11:53:07	118	0.09	1	0	0	0	0	0	0	0	80
11:54:06	171	0.09	1	0	0	0	0	0	0	0	70
11:55:03	159	0.08	1	0	0	0	0	0	0	0	60
11:55:44	212	0.09	1	3	0	0	0	0	0	0	5300ft P1 interupt
											P1 restart @ 5300ft
											Profile cancelled
12:	Run never	called	Low conc	approx	100 on 2dc	large	water	droplets			Start run 1 in cloud @ 5300ft
											End run 1
											FFSSP restarted - not respoonding
12:12:55	19	0.08	0	2	0	0	0	0	0	0	Start run 2 @7300ft
12:14:00	376	0.47	23	3000	431	450	1	5541	400	1	In cloud
12:14:51	29	0.09	88	0	0	0	0	0	0	0	End of run 2
12:18:24	38	0.09	88	3	0	0	0	0	0	0	Start run 3 @ 7800ft
12:19:00	185	0.28	95	3000	300	400	1	2999	3000	1	In cloud
12:19:52	35	0.09	145	10	0	0	0	0	0	0	End run 3
12:23:04	38	0.09	145	3	0	0	0	0	0	0	Start run 4 @ 8100ft
12:23:50	32	0.3	147	3000	277	250	1	441	200	1	In cloud
12:24:30	16	0.09	174	3	0	0	0	0	0	0	End run 4

CLOUD PHYSICS LOG

Flight No. B106 **Date: 30/06/05** **Operator: JT** **Page 2 of 2**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
12:27:38	28	0.09	174	3	0	0	0	0	0	0	Start run 5 @ 8300ft
12:29:05	1000	0.5	192	3000	500	200	1	No	Time		In cloud
12:29:20	14	0.1	193	3	0	0	0	0	0	0	end run 5
12:33:21	12	0.09	197	0	0	0	0	0	0	0	Start run 6 @ 8500ft
12:34:40	45	0.1	198	100	4.5	75	1	33	0	0	In cloud
12:35:19	15	0.09	199	0	0	0	0	0	0		End run 6
12:38:31	9	0.08	199	0	0	0	0	0	0	0	Start run 7 @ 8800ft
12:39:20	17	0.6	203	3000	0	0	0	41.6	N/a	N/a	In cloud
12:40:16	9	0.08	216	0	0	0	0	0	0	0	End run 7
12:43:13	6	0.09	216	0	0	0	0	0	0	0	Start run 8 @ 8800ft
12:44:10	11	0.57	220	3000	0	0	0	208	N/a	N/a	In cloud
12:45:20	5	0.08	226	0	0	0	0	0	0	0	End run 8
13:04:10	8	0.07	232	0	0	0	0	0	0	0	Start run 9 @ 8900ft
13:04:43	500	0.6	252	3000	288	650	1	1842	800	1	In Cloud
13:05:21	16	0.09	300	0	0	0	0	0	0	0	End run 9
13:08:50	21	0.2	305	0	0	0	0	0	0	0	Start run 10 @ 8900ft
13:09:34	1366	0.75	321	3000	411	225	1	1175	200	1	In Cloud
13:10:17	14	0.09	366	0	0	0	0	0	0	0	End Run 10
13:13:21	4	0.07	366	0	0	0	0	0	0	0	Start run 11 @ 9200ft
13:14:19	52	0.4	376	3000	400	225	1	2616	600	1	In Cloud
13:15:20	13	0.08	430	0	0	0	0	0	0	0	End Run 11
13:17:56	7	0.08	430	0	0	0	0	0	0	0	Start run 12 @ 9700ft
13:19:07	723	0.6	455	3000	378	800	1	3291	3000	1	In Cloud
13:19:39	11	0.07	496	0	0	0	0	0	0	0	End run 12

CLOUD PHYSICS LOG

Flight No. B106 **Date: 30/06/05** **Operator: JT** **Page 3 of 3**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
13:23:04	10	0.07	496	0	0	0	0	0	0	0	Start run 13 @ 9700ft
13:24:05	500	0.7	515	3000	500	200	1	1000	400	1	In Cloud
13:24:15	5	0.09	525	0	0	0	0	0	0	0	End Run 13
13:27:38	13	0.08	525	0	0	0	0	0	0	0	Start run 14 @ 9700ft
13:28:35	500	0.7	544	3000	300	275	1	1000	200	1	In Cloud
13:29:12	12	0.08	567	0	0	0	0	0	0	0	End run 14
13:32:50	10	0.08	567	0	0	0	0	0	0	0	Start run 15 @ 10000ft
13:34:39	500	0.2	Missed	Turret							End run
13:37:42	10	0.08	569	0	0	0	0	0	0	0	Start run 16 @ 1000ft
13:38:24	1000	0.7	593	3000	240	800	1	240	1200	1	In Cloud
13:38:08	4	0.07	593	0	0	0	0	0	0	0	End run 16
13:42:40	20	0.07	593	0	0	0	0	0	0	0	Start run 17 @ 10200ft
13:43:50	400	0.7	613	3000	1200	150	1	800	missed	1	In Cloud
13:44:19	7	0.08	613	0	0	0	0	0	0		End run
13:47:02	9	0.08	613	0	0	0	0	0	0	0	Start run 18 @ 9700ft
	Missed	Turret									In Cloud
13:48:58											End run 18
13:55:20	13	0.08	613	0	0	0	0	0	0	0	P2 @ FL110
13:56:17	7	0.08	613	0	0	0	0	0	0	0	100
13:57:34	5	0.08	613	0	0	0	0	0	0	0	90 P2interupted
13:59:34	3	0.07	613	0	0	0	0	0	0	0	90 P2 restarted
14:00:35	15	0.09	613	10	0	0	0	0	0	0	80
14:01:31	43	0.09	613	0	0	0	0	0	0	0	70
14:02:31	185	0.1	613	3	0	0	0	0	0	0	60
14:03:49	225	0.1	613	3	0	0	0	0	0	0	50
14:05:19	176	0.1	613	10	0	0	0	0	0	0	4400ft P2 interrupted

CLOUD PHYSICS LOG

Flight No. B106 **Date: 30/06/05** **Operator: JT** **Page 4 of 4**

G.M.T.	PCASP		FSSP	SID1	2D2-C			2D2-P			Remarks
DRS Time	Conc/cc	Mean R	Block Transfer	Particle Count	Conc/L	Max Size	Habit	Conc/m3	Max Size	Habit	
14:08:34	181	0.09	613	3	0	0	0	0	0	0	4400ft P2 restarted
14:09:07	226	0.09	613	10	0	0	0	0	0	0	40
14:11:04	219	0.09	613	3	0	0	0	0	0	0	30
14:13:05	224	0.09	613	10	0	0	0	0	0	0	20 P2 interrupted
14:15:02	231	0.09	613	30	0	0	0	0	0	0	20 P2 restarted
14:17:26	277	0.09	613	100	0	0	0	0	0	0	1000ft
14:18:42	315	0.09	613	100	0	0	0	0	0	0	500ft P1 end and run 19 start
14:20:00	200	0.1	613	70	0	0	0	0	0	0	Run 19 @ 500ft
14:22:00	278	0.09	613	70	0	0	0	0	0	0	
14:24:00	292	0.08	613	70	0	0	0	0	0	0	
14:26:00	228	0.09	614	70	0	0	0	0	0	0	
14:26:30	216	0.09	614	70	0	0	0	0	0	0	End of run 19
14:28:20	199	0.09	614	70	0	0	0	0	0	☺	Start run 20 @ 1500ft
14:30:00	178	0.09	614	100	0	0	0	0	0	0	
14:32:00	163	0.09	614	90	0	0	0	0	0	0	
14:34:00	260	0.08	614	70	0	0	0	0	0	0	
14:36:00	298	0.08	615	70	0	0	0	0	0	0	
14:36:22	240	0.08	615	70	0	0	0	0	0	0	End of run 20

Flight No 8106

CCNC LOG

Exp. ICEPIC

Date 30/06/05

Page 1 of 1

ALLEVIATOR GMT		Height	Dyn	STATIC						REMARKS
ON	OFF			1	2	3	4	5		
121301	121342	7000ft		1.75	2.5	3.5	4.25	5.5		
			26.52	0.48					S	
				378					D	
				558					B	
				2348					R	
				9888					P	
141900	14950	8000ft	23.80	0.49	0.73	1.10	1.42	2.07	S	
			23.64	564	720	773	854	1105	D	
			23.58	480	480	435	453	416	B	
			2330	2261	2281	2295	2279	2291	R	
			23.18	997.4	997.4	997.5	997.4	997.3	P	
				1.75	2.5	3.5	4.25	5.5		
142820		16000ft	2358	0.50	0.72	1.11	1.43	2.09	S	
			2346	566	600	709	1154	1497	D	
			2320	391	380	373	373	366	B	
			2318	2293	2301	2304	2306	2316	R	
			2297	997.4	997.5	997.4	997.4	997.5	P	
									S	
									D	
									B	
									R	
									P	
				1.75	2.5	3.5	4.25	5.5		
									S	
									D	
									B	
									R	
									P	
									S	
									D	
									B	
									R	
									P	

AMS PreFlght Setup/Cal Sheet v2.00

DATE: 30/6/05 FLIGHT: OPERATOR: M Cox

Time:	Action:	Location:	Yes/No:	Notes	Comments:
Power ON	Ensure Inlet Closed	Inlet Valve	✓		ARRIVED 05:56
	Ensure Multiplier Off	Electronics box	✓		
	Ensure Heater Off	Electronics box	✓		
	Ensure all Pumps Off	Pump Control box	✓		
	Turn on 230V Breaker	Power unit on a/c wall	✓		
	Turn on: Electronics box power Diaphragm pump power Turbo pump power CPC Power, both Buttons	Power distribution box	✓ ✓ ✓ ✓		16A 4A
	Open backing pump valve	Front facing side of rack.	✓		
	Turn on Alcatel...100% speed Turbo pumps 2 and 3 ON...100% Turbo pumps 4 and 5 ON...100% Turbo pump 6 ON...100%	Pump Control Box, after #6 Pump Control Box Pump Control Box Pump Control Box	✓ ✓ ✓ ✓	**Monitor Pump Currents**	2 0.32A 3 0.4A 4 0.62A 5 0.46A 6 0.52A
	Plug in CPC fill bottle	Rear of CPC			
	Turn on heater	Electronics box		Approx 2.8V, 0.9A @06	2.3V 0.9A
Pre-Brief	Turn on Balzers Box	Power distribution box and Balzers box	✓		07:26 GMT
	Turn on Copper	Electronics box	✓	Approx 125Hz	
	Turn on PC/Monitor	Power distribution box and PC	✓		
	Start AMS software	PC Desktop	✓		
	Turn autosaving off	Parameter menu, Averaging and saving tab	✓	NEGATIVE NUMBER	
	Reduce Multiplier voltage by 0.5kV	Parameter menu, Muliplier and chopper tab	✓		
	Set filament to 0.00mA,Scan range 0-300amu	Parameter menu, Mass Spectrometer tab	✓		
	Turn Multiplier on	Electronics box	✓		
	Turn filament on @0.05mA	MS mode, shift+B, click emmision arrow	✓		

AMS PreFlght Setup/Cal Sheet v2.00

DATE: 30/6/05 FLIGHT: 106 OPERATOR: M COE

Time:	Action:	Location:	Yes/No:	Notes	Comments:
Post Brief	Increase Multiplier voltage by 0.5kV	Parameter menu, Muliplier and chopper tab	✓		INC TO 2.45
	Close Grimm valve	Inlet valve	N/A		
	CPC in low flow	Shift+total on CPC display	✓		
	Check RF box, Tune if needed	Turn Tune Screw on RF Box for best hit	✓		NEEDED TUNE 1 DIV
	Log CPC on AMS serial port 2	Parameter menu, Serial port tab	✓		
	Set mass range scan 0-300	Parameter menu, Mass Spectrometer tab	✓		
	Open AMS inlet	Inlet valve	✓		
	Increase filament to 2.5mA	MS mode, shift+B, click emmision arrow	✓		
	Toggle chopper in MS mode	Press T within MS mode	✓		
0855	Check Airbeams and flows	Add m28 to m/z selection, Clean pin hole???	✓	F=1.9,AB approx 2.3MHz	F=1.926 AB 276
	Tune Balzers	Software	✓	Ensure no major changes	
	Electron Multiplier Cal	Software, select suitable point manually	✓	Gain approx 3e6	AS BEFORE 3.0
	Get tof masses for IE cal	Software,mz selection,left click on row	✓	15,16,17,30,46*	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓	wait	
	Mass Range Cal	MS mode, Click Mass Calibration	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Run in MS-TOF alteration	Software	✓	Check tof windows	
	IE cal after 200 particles	Shift+M while sampling,Calibtrate,Save,Exit		SMPS s=4.1,a=0.41,350nm	
	Remove CPC butanol from aircraft	Rear of CPC	✓		
	CPC in high flow	Shift+total on CPC display	✓		
	Reconnect inlet and GRIMM	Inlet			
	Set CPC port=0 in AMS software	Parameter menu, Serial port tab	✓	LOG CPC IN LABVIEW	
	Set PC time with Horace	Desktop plus internet explorer	✓		
	Set mass range scan	Parameter menu, Mass Spectrometer tab	✓		
	Select tof masses to scan	Software,mz selection,left click on row	✓	14,16,30,43,44,46,48,57	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Set DC marker 3 pos=6200	Parameter menu, Averaging and saving tab	✓		
	Backup parameter file	C:\AMS\AMSCODE\AMSMenu.prm	✓		
	Set save interval	Parameter menu, Averaging and saving tab	✓	0.5 minutes????	
	Reconnect inlet, Close AMS valve	Inlet			
	Start CPC software	PC Desktop	✓		
	General Alteration mode,Open Inlet	Software, Start after t/o			

AMS PostFlght Setup/Cal Sheet v2.00

DATE: FLIGHT: OPERATOR:

Time:	Action:	Location:	Yes/No:	Notes	Comments:
Pre-land	Stop AMS,Grimm CPC logging	Software	✓		
	Close AMS inlet	Inlet	✓		
	Exit Labview		✓		
	Enable CPC in AMS software	Parameter Menu, Serial Ports tab	✓		
Post-land	Set CPC in Low Flow	Shift+totalizer on CPC display	✓		
	Open Inlet		✓		
	Turn off autosave (-ve number)	Parameter Menu,Averaging and saving tab	✓		
	Set mass range scan 0-300	Parameter menu, Mass Spectrometer tab	✓		
	Electron Multiplier Cal	Software, select suitable point manually	✓	Check gain at current V	2.45 kV 2.37·10^6 Gain
	Get tof masses for IE cal	Software,mz selection,left click on row	✓	15,16,17,30,46*	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓	wait	
	Mass Range Cal	MS mode, Click Mass Calibration	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Run in MS-TOF alteration	Software	✓	Check tof windows	
	IE cal after 200 particles	Shift+M while sampling,Calibtrate,Save,Exit		SMPS s=4.1,a=0.41,350nm	
	Attach Zero filter to inlet				
	Select tof masses to scan	Software,mz selection,left click on row		14,16,30,43,44,46,48,57	
	Set thresholds In tof mode	Left click "SP thresholds" in left border			
	Add m28 to tof list	Software,mz selection,left click on row			
	General alteration,10 mins	Software, F3 to NonAutoSave		Check tof windows	
	Close inlet				
Data	Copy AutoSaveData folder	Source C:\AMS\AMSData\AutoSaveDate			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy NonAutoSaveData folder	Source C:\AMS\AMSData\NonAutoSaveDate			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy AMSLogFiles folder	Source C:\AMS\AMSData\AMSLogFiles			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy CPC data	Source C:\UCPC\			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Backup directory to DVD/laptop				
	Delete AutoSaveData	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete NonAutoSaveData	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete AMSLogFiles	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete CPC data	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
ShutDown	Turn off Mulitplier & Balzers	Electronics box			
	Turn off all Turbos and PC	Pump Controller Box			
	Shut Backing Valve	Back of rack			
	Turn off heater,chopper,the rest	Electronics box, then power unit and Breakers			

AMS PreFlght Setup/Cal Sheet v2.00

DATE: FLIGHT: OPERATOR:

Time:	Action:	Location:	Yes/No:	Notes	Comments:
Post Brief	Increase Multiplier voltage by 0.5kV	Parameter menu, Muliplier and chopper tab	✓		
	Close Grimm valve	Inlet valve	✓		
	CPC in low flow	Shift+total on CPC display	✓		
	Check RF box, Tune if needed	Turn Tune Screw on RF Box for best hit	✓		
	Log CPC on AMS serial port 2	Parameter menu, Serial port tab	✓		
	Set mass range scan 0-300	Parameter menu, Mass Spectrometer tab	✓		
	Open AMS inlet	Inlet valve	✓		
	Increase filament to 2.5mA	MS mode, shift+B, click emmision arrow	✓		
	Toggle chopper in MS mode	Press T within MS mode	✓		
	Check Airbeams and flows	Add m28 to m/z selection, Clean pin hole???	✓	F=1.9,AB approx 2.3MHz	
	Tune Balzers	Software	✓	Ensure no major changes	
	Electron Multiplier Cal	Software, select suitable point manually	✓	Gain approx 3e6	
	Get tof masses for IE cal	Software,mz selection,left click on row	✓	15,16,17,30,46*	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓	wait	
	Mass Range Cal	MS mode, Click Mass Calibration	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Run in MS-TOF alteration	Software	✓	Check tof windows	
	IE cal after 200 particles	Shift+M while sampling,Calibtrate,Save,Exit	✓	SMPS s=4.1,a=0.41,350nm	
	Remove CPC butanol from aircraft	Rear of CPC	✓		
	CPC in high flow	Shift+total on CPC display	✓		
	Reconnect inlet and GRIMM	Inlet	✓		
	Set CPC port=0 in AMS software	Parameter menu, Serial port tab	✓	LOG CPC IN LABVIEW	
	Set PC time with Horace	Desktop plus internet explorer			
	Set mass range scan	Parameter menu, Mass Spectrometer tab	✓		
	Select tof masses to scan	Software,mz selection,left click on row	✓	14,16,30,43,44,46,48,57	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Set DC marker 3 pos=6200	Parameter menu, Averaging and saving tab	✓		
	Backup parameter file	C:\AMS\AMSCODE\AMSMenu.prm	✓		
	Set save interval	Parameter menu, Averaging and saving tab	✓	0.5 minutes????	
	Reconnect inlet, Close AMS valve	Inlet	✓		
	Start CPC software	PC Desktop	✓		
	General Alteration mode,Open Inlet	Software, Start after t/o	✓		

AMS PostFlght Setup/Cal Sheet v2.00

DATE: FLIGHT: OPERATOR:

Time:	Action:	Location:	Yes/No:	Notes	Comments:
Pre-land	Stop AMS,Grimm CPC logging	Software	✓		
	Close AMS inlet	Inlet	✓		
	Exit Labview		✓		
	Enable CPC in AMS software	Parameter Menu, Serial Ports tab	✓		
Post-land	Set CPC in Low Flow	Shift+totalizer on CPC display	✓		
	Open Inlet		✓		
	Turn off autosave (-ve number)	Parameter Menu,Averaging and saving tab	✓		
	Set mass range scan 0-300	Parameter menu, Mass Spectrometer tab	✓		
	Electron Multiplier Cal	Software, select suitable point manually	✓	Check gain at current V	
	Get tof masses for IE cal	Software,mz selection,left click on row	✓	15,16,17,30,46*	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓	wait	
	Mass Range Cal	MS mode, Click Mass Calibration	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	Run in MS-TOF alteration	Software	✓	Check tof windows	
	IE cal after 200 particles	Shift+M while sampling,Calibtrate,Save,Exit	✓	SMPS s=4.1,a=0.41,350nm	
	Attach Zero filter to inlet		✓		
	Select tof masses to scan	Software,mz selection,left click on row	✓	14,16,30,43,44,46,48,57	
	Set thresholds In tof mode	Left click "SP thresholds" in left border	✓		
	Add m28 to tof list	Software,mz selection,left click on row	✓		
	General alteration,10 mins	Software, F3 to NonAutoSave	✓	Check tof windows	
	Close inlet				
Data	Copy AutoSaveData folder	Source C:\AMS\AMSData\AutoSaveDate			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy NonAutoSaveData folder	Source C:\AMS\AMSData\NonAutoSaveDate			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy AMSLogFiles folder	Source C:\AMS\AMSData\AMSLogFiles			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Copy CPC data	Source C:\UCPC\			
		Dest C:\AMS\SAMSData\Summer05\flight			
	Backup directory to DVD/laptop				
	Delete AutoSaveData	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete NonAutoSaveData	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete AMSLogFiles	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
	Delete CPC data	Source C:\AMS\AMSData\AutoSaveDate		FILES ONLY, NOT FOLDER	
ShutDown	Turn off Mulitplier & Balzers	Electronics box			
	Turn off all Turbos	Pump Controller Box			
	Shut Backing Valve	Back of rack			
	Turn off heater,chopper,the rest	Electronics box, then power unit and Breakers			

AMS Diagnostic Log Sheet v2.00

DATE: FLIGHT: OPERATOR:

Time 1046

Pump #	I(A)	I (typical)	Speed (%)	Speed typical
1/Alcatel	[illegible]	0.86	[illegible]	98
2	3.19	3.5	100.4	100
3	1.29	1	100	100
4	0.57	0.5	100	100
5	0.43	0:4	100	100
6	0.41	0.46	100	100

	New	Typical
Heater V		2.5
Heater I		0.9
Heater T		580
Heater B		75V
Multiplier		n/a
Pressure		2 Torr

	New	Typ
I electronics		1
I turbo		7
I diaphragm		2
MS AB		2.2I
TOF AB		2M
Flow		2

Time

Pump #	I(A)	I (typical)	Speed (%)	Speed typical
1/Alcatel		0.86		98
2		3.5		100
3		1		100
4		0.5		100
5		0.4		100
6		0.46		100

	New	Typical
Heater V		2.5
Heater I		0.9
Heater T		580
Heater B		75V
Multiplier		n/a
Pressure		2 Torr

	New	Typ
I electronics		1
I turbo		7
I diaphragm		2
MS AB		2.2I
TOF AB		2M
Flow		2

Time

Pump #	I(A)	I (typical)	Speed (%)	Speed typical
1/Alcatel		0.86		98
2		3.5		100
3		1		100
4		0.5		100
5		0.4		100
6		0.46		100

	New	Typical
Heater V		2.5
Heater I		0.9
Heater T		580
Heater B		75V
Multiplier		n/a
Pressure		2 Torr

	New	Typ
I electronics		1
I turbo		7
I diaphragm		2
MS AB		2.2I
TOF AB		2M
Flow		2

Time

Pump #	I(A)	I (typical)	Speed (%)	Speed typical
1/Alcatel		0.86		98
2		3.5		100
3		1		100
4		0.5		100
5		0.4		100
6		0.46		100

	New	Typical
Heater V		2.5
Heater I		0.9
Heater T		580
Heater B		75V
Multiplier		n/a
Pressure		2 Torr

	New	Typ
I electronics		1.
I turbo		7.
I diaphragm		2.
MS AB		2.2I
TOF AB		2M
Flow		2

30/6/05 THURS 30th

05:55 UT POWER ON

06:10 UT ALL ON THIS OK.

EM Cal 2.45 kV
3.06 e10

F1/2 DoA not detecting particles
SP Threshold not set correctly, reduce background
Finally, no beam to do IE on now. ok well.

~~10~~ 10:58 UT
Inlet/Pressure event 11:00Z.

11:11Z Switched to CVI inlet
Sampled 100 $\mu g l^{-3}$ of butanol
SP Stable thereafter, PC and TS keeps cycling.
Count fell from 100/cm^3 to <1/cm^3 in <1s.
Could maybe live.
Settling down time but will take some time to clear
0.4 $\mu g l^{-3}$ @ 11:17Z.

1:26Z 200 particles/cc a 3025 –
cloud inlet BUT Tsyba
its butanol nucleation!

11:30Z Shut inlet off as it down + getting
butanol in last – CVI

11:33Z Looks like some pick up –
MS – seeing oscillations in MS
Mass flow – intermittent

11:45Z Switched back to Pressure
– Inlet Open.

11:46Z Concerned about pick up
problems

11:56Z Unit reached
assembly JDMS
now in General Alternation Mode.
12:00Z Gas inlet valve out
12:10Z Back at Basement.

12:[illegible]55Z Start down 12 process.

12:13:30 AMS exhibit valve off.

12:16Z Back at Basement.

12:18Z Back at Gas inlet level

12:20Z Basement.
12:23:20Z Closed
12:24:46Z Basement
12:28:45Z Closed
12:25:46Z Basement
12:34Z Closed.
12:35:19Z Basement
12:39 - 12:40Z Closed
Back at Basement

12:55Z Origin Nitrogen Exhaust valve

13:02Z 2450 psi/cc

1632 inlet closed, loaded.

1646 Doing filter run.

1831 local filter down.

Flight Manager's Instrument Status Log

Flight No. **B**106 Date: 30/06/05

Instrument	Fitted	Operated	Instrument	Fitted	Operated
Navigation			**Cloud Physics**		
INU		**Y**	**Probes**		
GPS		**Y**	FFSSP	**Y**	**Y**
Satcom C		**Y**	PCASP	**Y**	**Y**
Satcom H		**Y**	2D-P	**Y**	**Y**
Thermometers			2D-C	**Y**	Y
De-Iced Temp		**Y**	Cloudscope	**N**	**N**
Non De-Iced		**Y**	SID 1	**Y**	**Y**
Heimann	**N**		SID 2	**N**	
Hygrometers					
G. Eastern		**Y**	HVPS	**N**	
J. Williams		**Y**	CIP25	**Y**	**N**
Nevzorov		**Y**	CIP100	**Y**	**N**
TWC		**Y**			
FWVS	**Y**	**N**	**Racks:**		
Radiometers			INC	**Y**	**N**
Upper Clear	**Y**	**Y**	CCN / CNC	**Y**	**Y**
" Red	**Y**	**Y**	CVI	**Y**	**Y**
" Silicon	**Y**	**Y**			
" JO1D	**Y**	**Y**	**Aerosol**		
Lower Clear	**Y**	**Y**	PSAP	**Y**	**N**
" Red	**Y**	**Y**	Nephelometer	**N**	
" Silicon	**Y**	**Y**	Filters	**Y**	**N**
" JO1D	**N**		AMS	**Y**	**Y**
Large Radiometers					
TAFTS	**N**				
MARSS	**N**				
DEIMOS	**N**		**Others:**		
ARIES	**N**		NIR TDLAS	**Y**	**N**
SWS	**N**		2BT O3	**Y**	**N**
Chemistry			VACC	**Y**	**N**
Ozone	**Y**	**Y**	PEROXIDE	**Y**	**N**
ECGC	**N**		Formaldehyde	**Y**	**N**
NOX	**Y**	**Y**	ADA	**Y**	**Y**
CO	**Y**	**Y**	CPI	**Y**	**Y**
ORAC	**Y**	**N**	NOxy	**Y**	**N**
PAN	**Y**	**N**	PTRMS	**Y**	**N**
PERCA	**N**	**N**	Bag Sampling	**Y**	**N**
WAS	**Y**	**N**			

Faults / Incidents Log

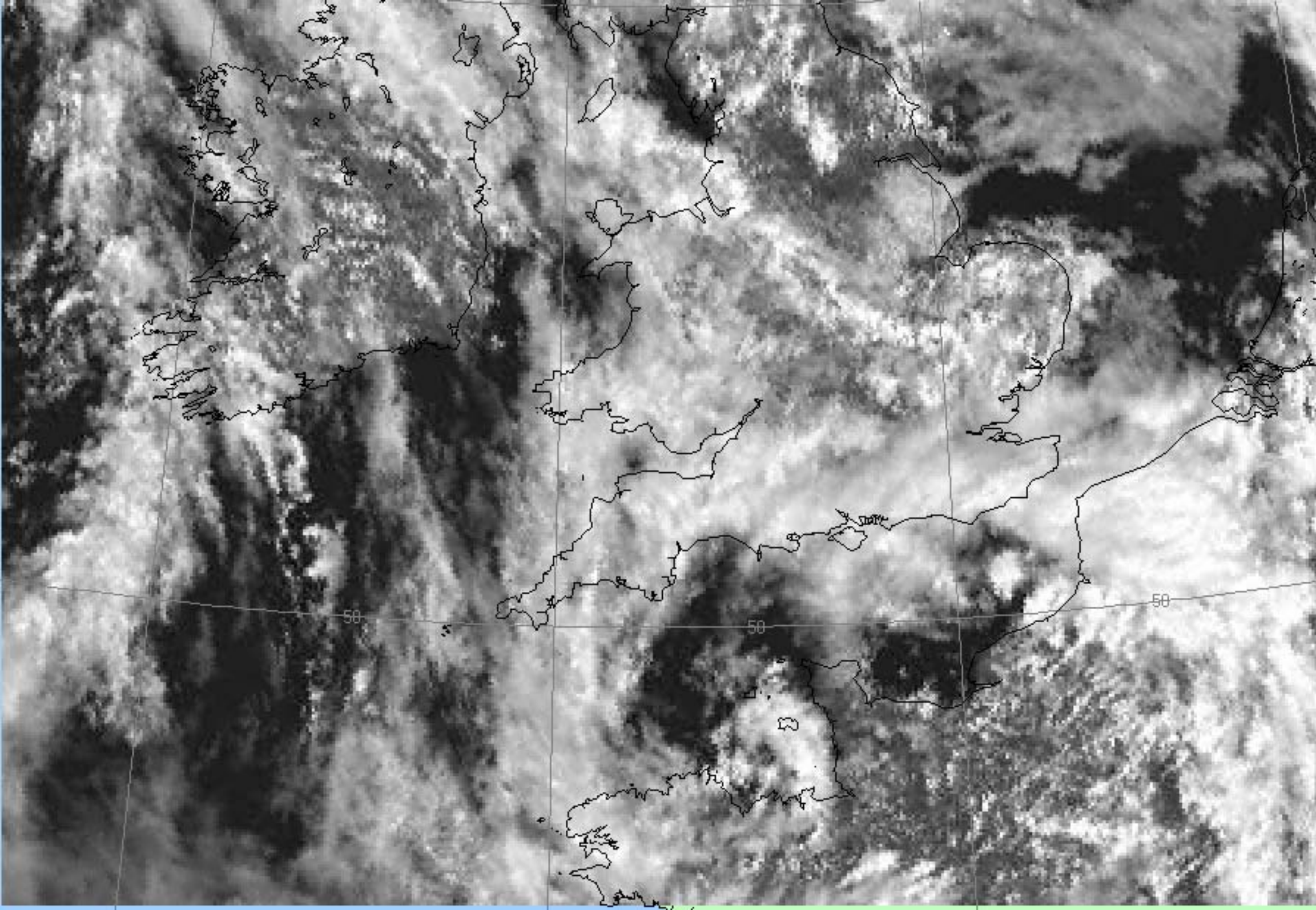
Flight No. B106
Date: 30/06/05

Instruments

1. Video – DFC display out of focus. Inboard display switches off . Also, RFC (marked DFC…) is virtually black on pc monitor, whereas it displays well on video monitor unit.
2. CVI – butanol in exhaust pipe
3. CVI – AMS after 7000ft flow stopped and started sucking butanol into plenum from 3010, meaning AMS being contaminated with butanol.

Aircraft

Satcom H:-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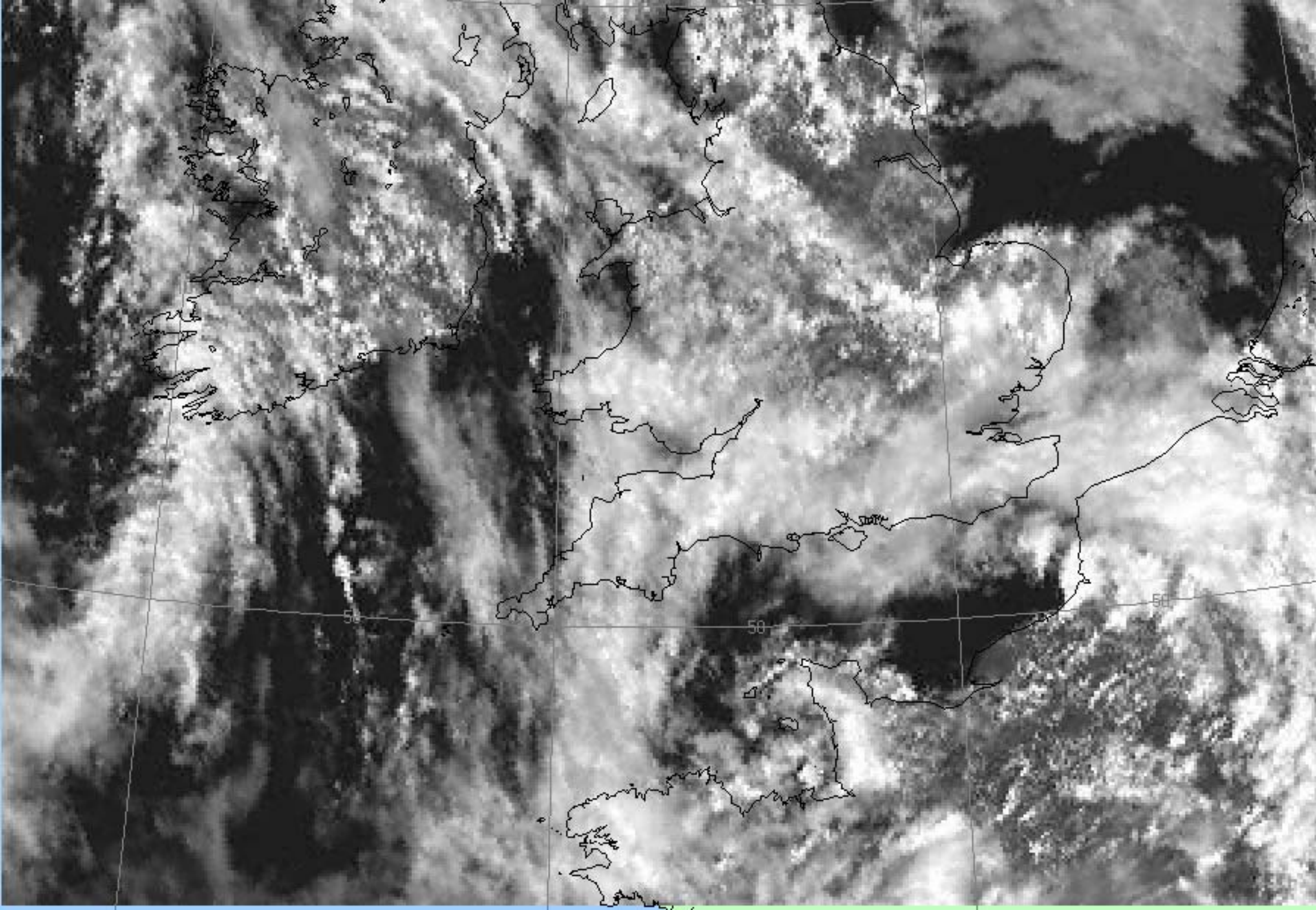
50
50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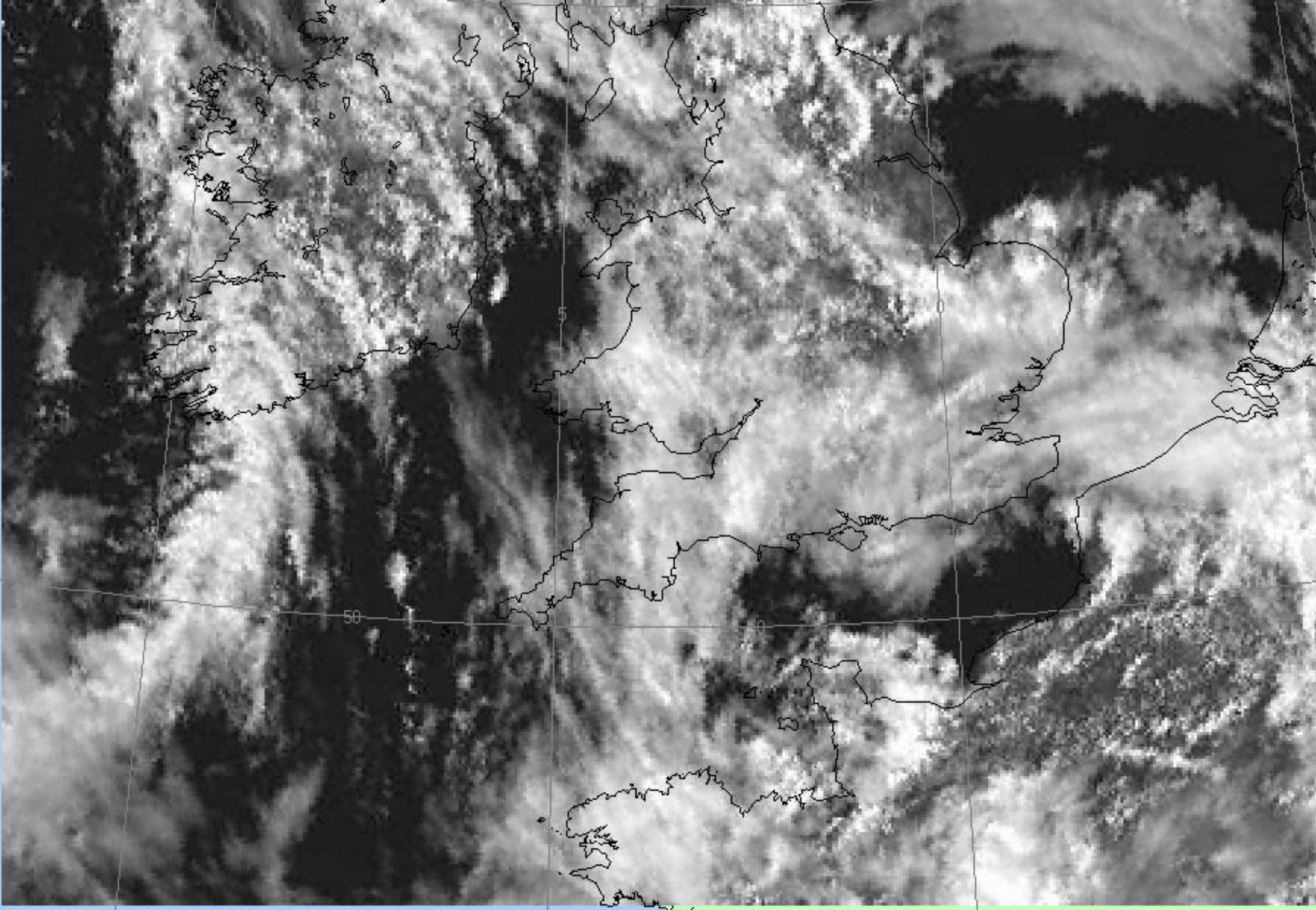
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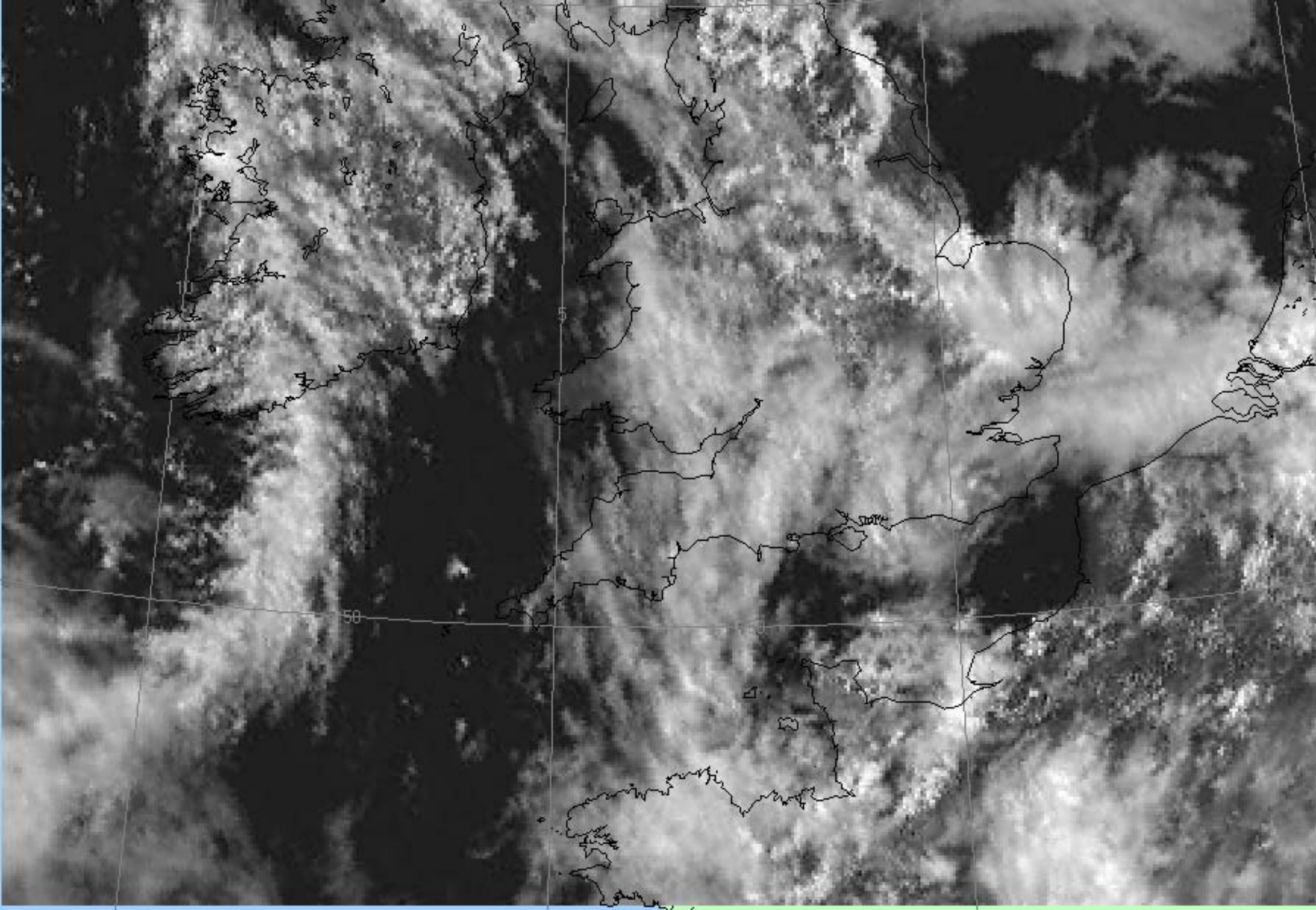
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5
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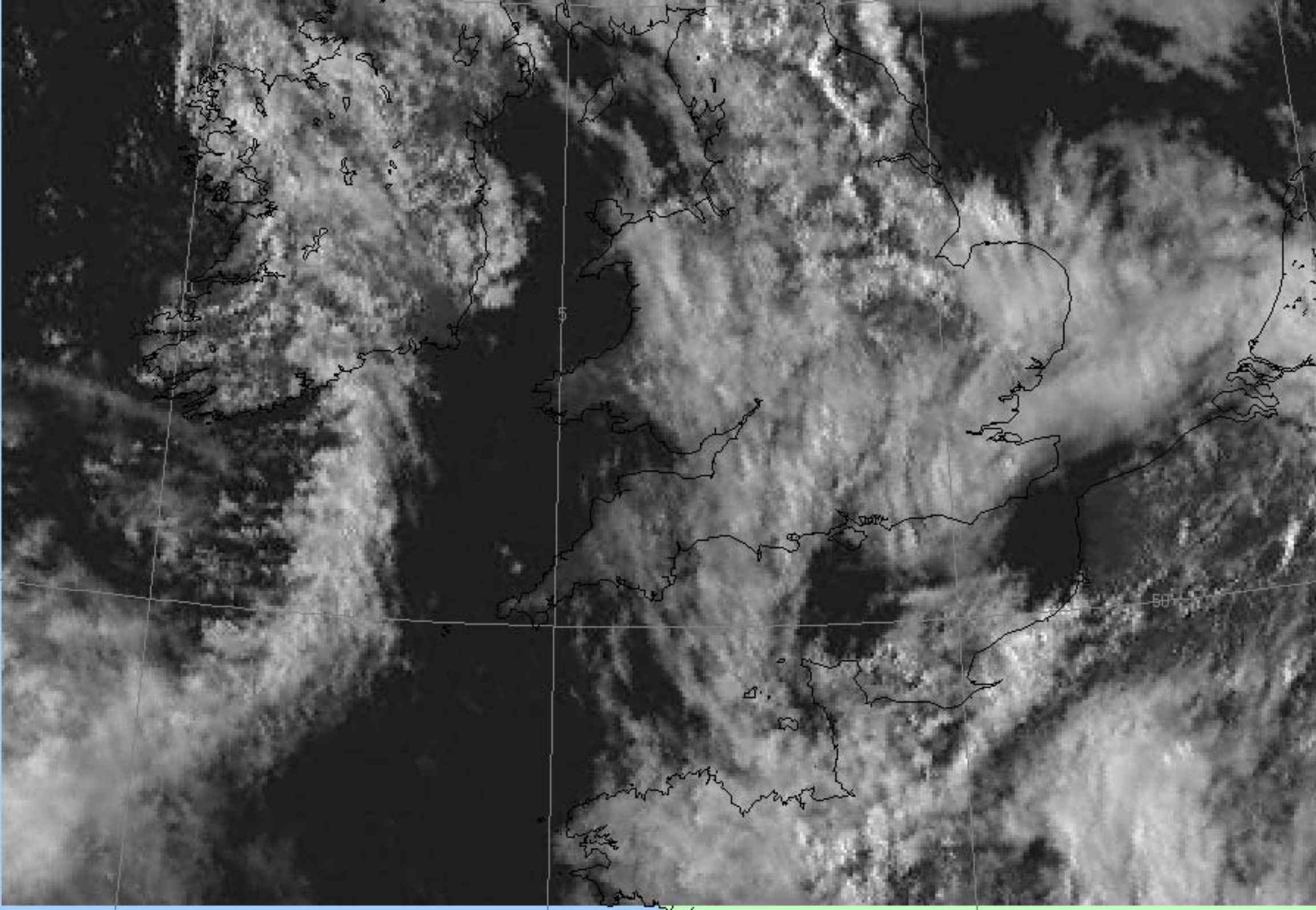
5
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MISSING LOG SHEETS:

The following logs are not available for flight B106:

Log	**Reason**
CVI	No log is ever taken for CVI
ADA/CPI	No log taken or no copy left with FAAM